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CONTRIBUTIONS TOWARD A KNOWLEDGE OF THE
INSECT FAUNA OF LOWER CALIFORNIA*

No. 6

DIPTERA: CULICIDAE

BY

THOMAS H. G. AITKEN

*Division of Entomology and Parasitology
University of California*



THE FOLLOWING ACCOUNT is based primarily on material collected by Dr. and Mrs. A. E. Michelbacher and Dr. E. S. Ross during a trip to Lower California in the summer of 1938. Inasmuch as the writer had access to additional mosquito collections belonging to the California Academy of Sciences, it seemed wise to include in this discussion the additional records from the Revil-lagidedo Islands (State of Colima), which lie approximately 240 miles south of Cape San Lucas.

Our knowledge of the mosquito fauna of these regions has been very meager in the past. The most recent treatise on Mexican mosquitoes is that of Martini (1935); of the 114 species reported by him, only two records are from the peninsula [*Culex quinquefasciatus* Say (*fatigans* Wiedemann) and *Culex tarsalis* Coquillett], see also Howard, Dyar and Knab, 1915, p. 234, 357. Other species previously recorded are: *Anopheles maculipennis* Meigen and *Anopheles pseudopunctipennis* Theobald (*franciscanus* McCracken) (Dyar, 1907) and *Aedes aegypti* (Linnaeus) [*Stegomyia fasciata* (Fab.)] (Theobald, 1907).

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Although still far from complete, the additional information obtained by the Michelbachers and Ross is of great value, inasmuch as it has extended our knowledge of the distribution of certain species and in one instance has resulted in the recognition of a new subgenus and species of *Aedes*. The writer is indebted to these collectors for the opportunity to study this material, the great majority of which has been deposited in the California Academy of Sciences.

Inasmuch as the Lower Californian material appears to represent in many instances a southern distribution of the Californian fauna, an asterisk preceding the specific name will designate this condition.

Tribe ANOPHELINI

(1) *Anopheles* (*Anopheles*) *maculipennis* Meigen†

Anopheles maculipennis MEIGEN, 1818, Syst. Besch. Zweifl. Ins., 1:11; NUTTALL and SHIPLEY, 1901, Jour. Hyg., 1:45, 269, 451; *ibid.*, 1902, 2:58; *ibid.*, 1903, 3:166; HACKETT and MISSIROLI, 1935, Riv. Malariol., 14:3; DIEMER and VAN THIEL, 1936, Konin. Akad. v. Wetensch. te Amsterdam, Science, Proceed., 39:109; BEKLEMISHEV and ZHELOCHOVTSEV, 1937, Medit. Parazit., 6:819; BATES, 1940, Ann. Ent. Soc. Amer., 33:343.

Culex claviger FABRICIUS, 1805, Syst. Antl., p. 35 (nec *C. claviger* MEIGEN, 1804).

Anopheles alexandrae-shingarevi SHINGAREV, 1928, Russk. Zhur. Trop. Medit., 6:48.

Anopheles maculipennis var. *typicus* MARTINI, MISSIROLI and HACKETT, 1931, Arch. f. Sch. u. Tropenhyg., 35:622.

Anopheles claviger var. *basilei* FALLERONI, 1932, Tipografia Cuggiani (Roma).

This holaretic species is represented in Lower California by a single subspecies (*freeborni*). Typical *maculipennis* does not occur in North America (Aitken, 1939, 1941).

* (1a) *Anopheles* (*Anopheles*) *maculipennis freeborni* Aitken

Anopheles maculipennis freeborni AITKEN, 1939, Pan.-Pac. Ent., 15:191¹; AITKEN, 1942, Univ. Calif. Publ. Ent. (in press).

Anopheles freeborni, VARGAS, 1940a, Ciencia, 1:66.

Anopheles maculipennis, DYAR, 1907, Proc. U. S. Nat. Mus., 32:121 (in part; record²); HERMS and FREEBORN, 1920, Jour. Parasit., 7:69 (egg); FREEBORN, 1926, Univ. Calif. Pub., Tech. Bull., Ent., 3:448 (in part); DYAR, 1928, Carnegie Inst. Wash., Pub. No. 387, p. 452 (in part); MATHESON, 1929, Mosqs. North America, p. 88 (in part); HERMS and FROST, 1932, Jour. Parasit., 18:240 (egg); FROST, 1932, Jour. Parasit., 18:282 (terminalia).

Anopheles occidentalis DYAR and KNAB, 1906, Proc. Biol. Soc. Wash., 19:159 (in part); HOWARD, DYAR and KNAB, 1917, Carnegie Inst. Wash., Pub. No. 159, 4:1026 (in part); VARGAS, 1940a, Ciencia, 1:66.

A series of 73 specimens (females) have been examined and are quite typical of this subspecies. The pale apical wing spot, dark smudgy wing spots, clearly demarcated mesonotal markings and the pure white scale patch of the occiput and anterior mesonotum of the subspecies *occidentalis* (Dyar and Knab) are absent; likewise they do not exhibit the narrowly linear wing

† Several synonyms have been omitted because they pertain to other subspecies.

scales, indistinct wing spots, generally larger size (including wings), and somewhat reddish thorax of the subspecies *aztecus* Hoffmann.

Many of the specimens are well engorged with blood; this mosquito was extremely annoying at Santo Tomas, where it entered the tent during the night.

Type locality: Davis, Yolo County, California, XI-6-37, T. Aitken¹.

Recorded distribution: Western United States west of the Rocky Mountains from British Columbia to northern Mexico (except along the coast from San Luis Obispo County, California, northwards); Lower California: Distrito del Norte (Tiajuana)².

New records: Distrito del Norte (San Fernando Mission, July 31; 20 miles south of Santo Tomas, August 3).

Two recent papers by Vargas (1940a, b) have referred to "*Anopheles occidentalis*," indicating that this mosquito might occur in the northern part of Mexico. *Anopheles maculipennis occidentalis* has not as yet been taken south of Ventura County, California, whereas the writer has seen numerous specimens of *freeborni* from southern California, Arizona and New Mexico (as well as Lower California). It would seem therefore that Vargas' citations should be referred to *freeborni*, and that *occidentalis* should be removed from the list of Mexican anophelines; moreover, Vargas' larval characters designated for "*occidentalis*" are on the contrary largely typical of *freeborni*.

(2) *Anopheles (Anopheles) pseudopunctipennis* Theobald[†]

Anopheles pseudopunctipennis THEOBALD, 1901, Monog. Culic., 2:305; HOWARD, DYAR and KNAB, 1917, Carnegie Inst. Wash., Pub. No. 159, 4:1014 (*peruvianus*, *argentinus*, and *tucumans* syn.) SHANNON, DAVIS and DEL PONTE, 1927, Dept. Nac. de Hig., Inst. Bact., Rev. (Argentina), 5:29; DYAR, 1928, Carnegie Inst. Wash., Pub. No. 387, p. 448; MATHE-SON, 1929, Mosqs. North America, p. 91.

Anopheles peruvianus TAMAYO and GARCIA, 1907, Mem. Munic. Lima, 35.

Proterorhynchus argentinus BRETHER, 1912, Bol. Inst. Ent. y Pat. Veg. (Argentina), 1:15.

Anopheles tucumans LAHILLE, 1912, An. Mus. Nac. Buenos Aires, 23:253.

The *pseudopunctipennis* material (37 females, seven males) from Lower California appears, in the light of recent studies (Aitken, 1942), to be composed of two forms, *pseudopunctipennis* s.s. and *franciscanus*.

(2a) *Anopheles (Anopheles) pseudopunctipennis pseudopunctipennis* Theobald

Anopheles pseudopunctipennis THEOBALD, 1901, Monog. Culic., 2:305¹; ROOT, 1924, Amer. Jour. Hyg., 4:456 (terminalia); HOFFMANN, 1931, South. Med. Jour., 25:523; MARTINI, 1935, Dept. Salub. Pub., Bol. Tec., Serie A, No. 1, p. 20; ROZEBOOM, 1937, Jour. Parasit., 23:538 (egg); VARGAS, 1939, Med. Rev. Mexicana, 19:356 (in part); VARGAS, 1940a, Ciencia, 1:66 (larval key); VARGAS, 1940b, Rev. Inst. Salub. y Enfer. Trop., 1:79 (larva); VARGAS, 1940c, Rev. Inst. Salub. y Enfer. Trop., 1:199 (adult key).

Anopheles pseudopunctipennis pseudopunctipennis, AITKEN, 1942, Univ. Calif. Publ. Ent. (in press).

[†] The synonyms listed here were all described from central and southern South America, and possibly pertain to a distinct subspecies.

The phallosome leaflets of the male terminalia are extremely well developed and are distinctly serrated. The scales of the fourth longitudinal vein (M) are predominantly pale before the fork, and those on the stem of the second vein (R_{2+3}) are pale, except for a subbasal patch. In this respect these specimens agree with the predominant condition existing on the Mexican mainland, and which the writer believes to be typical *pseudopunctipennis*. Two specimens from Comondu appear to be intermediate in scale coloration; they have been included here because of the fact that two larvae from the same locality show well-developed "tails" on the postspiracular plates. The antepalpmate hairs of the fourth and fifth abdominal segments are single on one larva, but are double on the other; the antennal hair is single, except in one instance where it bifurcates at the apex. This Cape region material consists of 24 females, six males and two larvae (from barrel).

Type locality: "Grenada, February (Dr. Hatton, per Dr. Daniels)." Probably the Island of Grenada (see Aitken, 1942).¹

Recorded distribution: Roughly the greater portion of Mexico (possibly extending into Arizona, New Mexico and Texas) south along the west coast of South America to the northwestern provinces of Argentina, and in the middle of its range as far east as the Island of Trinidad.

New records: Distrito del Sur [San José del Cabo, July 2, 1938, Sr. Green; Comondu, July 22 (adults, and larvae in barrel)].

Inasmuch as malaria is present in San José del Cabo (information obtained from the local health officer) and *pseudopunctipennis* was the only anopheline collected in that town, it is possible that it may be responsible for transmitting the disease. The majority of specimens collected exhibit marked engorgement of blood.

*(2b) **Anopheles (Anopheles) pseudopunctipennis**
franciscanus McCracken

Anopheles franciscanus McCracken, 1904, Ent. News, 15:9²; DYAR, 1907, Proc. U. S. Nat. Mus., 32:121 (record)².

Anopheles pseudopunctipennis form "*franciscanus*," ROOT, 1924, Amer. Jour. Hyg., 4:456 (terminalia).

Anopheles pseudopunctipennis subspecies *franciscanus*, HOFFMANN, 1931, South. Med. Jour., 25:523; AITKEN, 1942, Univ. Calif. Publ. Ent. (in press).

Anopheles pseudopunctipennis, HOWARD, DYAR and KNAB, 1917, Carnegie Inst. Wash., Pub. No. 159, 4:1014 (in part); HERMS and FREEBORN, 1920, Jour. Parasit., 7:69 (egg); ROOT, 1923, Amer. Jour. Hyg., 3:264 (terminalia, var. *boydi*); FREEBORN, 1926, Univ. Calif. Pub., Tech. Bull., Ent. 3:454 (terminalia, var. *boydi*); DYAR, 1928, Carnegie Inst. Wash., Pub. No. 387, p. 448 (in part; terminalia); MATHESON, 1929, Mosqs. North America, p. 91, (in part; terminalia); HERMS and FROST, 1932, Jour. Parasit., 18:282 (egg, var. *boydi*); FROST, 1932, Jour. Parasit., 18:282 (terminalia, var. *boydi*); VARGAS, 1939, Med. Rev. Mexicana, 19:356 (in part).

Anopheles boydi VARGAS, 1939, Med. Rev. Mexicana, 19:356.

Anopheles pseudopunctipennis franciscanus var. *boydi*, AITKEN, 1942, Univ. Calif. Publ. Ent. (in press).

The phallosome leaflets of the male terminalia are extremely delicate and poorly developed. The scales of the fourth longitudinal vein (M) are dark before the fork, and the second vein (R_{2+3}) is entirely dark-scaled, except for a subapical white patch on the upper fork (R_2), and a tiny patch on the stem near the cross vein. A series of four specimens (one male) were studied; none showed signs of recent blood meals.

Type locality: Stanford University, Santa Clara County, California, V-5-03, I. McCracken¹.

Recorded distribution: Throughout California, with a scattered distribution in the southwestern states, probably extending south into Mexico as far as the states of Sinaloa (Hoffmann, 1931) and possibly Morelos (Vargas, 1939); Lower California: Distrito del Norte (Tijuana, June 2, 1906, Dyar and Caudell)².

New records: Distrito del Norte (10 miles south of Punta Prieta, June 21; Rosarito Beach, July 5; San Fernando Mission, July 31; 20 miles south of Santo Tomas, August 3), Distrito del Sur (Coyote Cove, Concepcion Bay, 19 miles south of Mulegé, July 1).

As a result of recent studies (Aitken, 1941), the writer considers *pseudopunctipennis* to be composed of at least two subspecies, *Anopheles p. pseudopunctipennis* and *A. p. franciscanus*; the latter has tentatively been associated with the egg type described by Herms and Freeborn (1920), the males having weakly developed leaflets on the phallosome and the larvae lacking postspiracular "tails" (see Komp, 1937, Proc. Ent. Soc. Wash., 39:157).

The recently described *Anopheles boydi* Vargas (1939) from California (Sutter County), which is based entirely on the egg type described by Herms and Frost (1932), appears to be nothing more than a variety of *franciscanus* (Aitken, 1942); it is tentatively to be associated with males having no phallosomal leaflets.

Tribe CULICINI

* (3) *Aedes (Ochlerotatus) taeniorhynchus* (Wiedemann)

Culex taeniorhynchus WIEDEMANN, 1821, Dipt. Exot., p. 43¹.

Aedes taeniorhynchus, BUSCK, 1908, Smiths. Misc. Colls., 52:63; HOWARD, DYAR and KNAB, 1917, Carnegie Inst. Wash., Pub. No. 159, 4:667 (*damnosus*, syn.); FREEBORN, 1926, Univ. Calif. Pub., Tech. Bull., Ent., 3:414; DYAR, 1928, Carnegie Inst. Wash., Pub. No. 387, p. 218 (*niger*, *epinolus*, syn.); MATHESON, 1929, Mosqs. North America, p. 132; MARTINI, 1935, Dept. Salub. Pub., Bol. Tec., Ser. A., No. 1, p. 50.

Culex damnosus SAY, 1823, Jour. Acad. Nat. Sci. Phil., 3:11.

Taeniorhynchus niger GILES, 1904, Jour. Trop. Med., 7:382.

Aedes niger, HOWARD, DYAR and KNAB, 1917, Carnegie Inst. Wash., Pub. No. 159, 4:672 (*portoricensis*, syn.).

Culex portoricensis LUDLOW, 1905, Canad. Ent., 37:386.

Aedes epinolus DYAR and KNAB, 1914, Ins. Insc. Mens., 2:61.

A series of 73 specimens (females) from Lower California, and 25 (10 males) from the Revillagigedo Islands were studied (including male terminalia). All compared favorably with specimens from the southern Californian

coast with the exception that the fifth tarsomere of the hind legs has a tendency to be dark-scaled distally (at least on the ventral side); in this respect they resemble the form *epinolus* from Peru. The subapical black band of the abdominal sternites is quite prominent, particularly on the island specimens.

Type locality: Mexico¹.

Recorded distribution: Atlantic, Gulf and Caribbean coasts from Massachusetts to Brazil; West Indies (parts); Pacific coast from Santa Barbara County, California, south to Peru, including adjacent islands; Curran (1934, Proc. Calif. Acad. Sci., 4th ser., 21:147) reports this mosquito from the Galapagos Islands.

New records: Lower California, Distrito del Sur (Coyote Cove, Concepcion Bay, 19 miles south of Mulegé, July 1, 24; Magdalena Bay, July 18). Revilagigedo Islands (Clarion Island, April 28, 1925, H. H. Keifer; Socorro Island, Braithwaite Bay, May 6, 1925, H. H. Keifer).

Many of the specimens from Lower California are well engorged or contain eggs. Michelbacher and Ross state that this mosquito was particularly pestiferous, especially on the return visit to Concepcion Bay (July 1st). Rather extensive salt marsh breeding areas were observed at Magdalena and Concepcion bays, which were characterized by the presence of mangrove trees.

(4) *Aedes (Finlaya) atropalpus* (Coquillett)

Culex atropalpus COQUILLET, 1902, Canad. Ent., 34:292¹.

Aedes atropalpus, DYAR and KNAB, 1906, Jour. N. Y. Ent. Soc., 14:189, 192; HOWARD, DYAR and KNAB, 1917, Carnegie Inst. Wash., Pub. No. 159, 4:638; DYAR, 1928, Carnegie Inst. Wash., Pub. No. 387, p. 213 (*epactius*, syn.); MATHESON, 1929, Mosqs. North America, p. 138; MARTINI, 1935, Dept. Salub. Pub., Bol. Tec., Ser. A., No. 1, p. 56; EDWARDS, 1932, Gen. Insect., p. 153 (*perichares*, syn.).

Aedes epactius DYAR and KNAB, 1908, Proc. U. S. Nat. Mus., 35:53; HOWARD, DYAR and KNAB, 1917, Carnegie Inst. Wash., Pub. No. 159, 4:642.

Aedes perichares DYAR, 1921, Ins. Insc. Mens., 9:36; DYAR, 1928, Carnegie Inst. Wash., Pub. No. 387, p. 221.

I have one female specimen before me from the Cape region which appears to belong to this species. The mesonotum is largely bare; fortunately, however, a few scales remain, particularly around the margins. These latter tend to be whitish on the anterior and lateral margins of the mesonotum and somewhat golden posteriorly; there are some indications of dark, red-brown scales just preceding the ante-scutellar space. The tarsi of the legs (in part missing) are marked as follows: front tarsi having narrow basal and apical white rings on the first three segments (extremely narrow on the apex of the third), middle tarsi with slightly broader basal and apical rings on the first two segments, hind tarsi with broad basal and apical rings on the first two segments. The abdominal sternites are entirely pale-scaled, there being no indication of an apical black band. Dr. Alan Stone (U. S. National Museum) has compared this specimen with slightly brushed *atropalpus* from the District of Columbia and could find no marked distinctions between them.

Type locality: Richmond, Virginia, September 26, E. G. Williams¹.

Recorded distribution: Atlantic coast region from Maine to North Carolina; Arizona [Sabiño Basin, Catalina Mts., August 23, 1918, larvae only, C. H. T. Townsend—Dyar, 1922 (*epactius*)] New Mexico [Last Chance Canyon, August 14—Barber, 1939 (*atropalpus*)]; Mexico [Almoloya, Oaxaca, July 20, 1905, F. Knab; Cordoba, Vera Cruz, January 4, 1908, F. Knab—H., D. and K., 1917 (*epactius*)]; Costa Rica [Ciruelas, Alajuela, October 29, 1920, A. Alfaro—Dyar, 1921 (*perichares*) and Liberia, Guanacaste—Kumm, et al., 1940 (*atropalpus*)]; and Nicaragua—Dyar, 1928 (*perichares*).

New records: Distrito del Sur (Triunfo, July 7).

The forms *epactius* and *perichares* are now synonyms of *atropalpus*, but formerly *perichares* was considered by Dyar a distinct species, and *epactius* the western race of *atropalpus*. It seems wise to group these all together, as the variations do not appear to be of a regional nature.

Larvae are usually found in rock pools and pot holes along streams. Kumm, Komp and Ruiz (1940, Amer. Jour. Trop. Med., 20:385) found the larvae in Costa Rica living in cemetery urns. Rock pools were observed by Michelbacher and Ross at Triunfo; the adult was taken at light.

(5) *Aedes (Kompia) purpureipes* Aitken

Aedes (Kompia) purpureipes AITKEN, 1941, Pan.-Pac. Ent., 17:82^{1, 2}.

This distinctly neotropical mosquito from the Cape region appears to be an *Aedes*, but because of the absence of post-spiracular setae (one of the principal characters of *Aedes*) a new subgenus, *Kompia*, has been proposed for it. This condition has its parallel in *Mansonia*, the subgenus *Coquillettidia* being separated from the other subgenera by the same character.

Unfortunately, the correct placement of the species will have to wait until male specimens have been taken.

Type locality: Triunfo, Distrito del Sur, Lower California, Mexico, July 7, 1938, A. E. Michelbacher and E. S. Ross.¹

Recorded distribution: Patagonia, Santa Cruz County, Arizona, August 8, 1940, E. S. Ross; Lower California: Distrito del Sur (Cape region—Miraflores, July 8, and five miles west of San Bartolo, July 13)².

New records: (see above).

One of the specimens from San Bartolo is well engorged with blood. All of the Lower California collections were made at light. The Arizona specimen was taken in the act of biting.

(6) *Aedes (Stegomyia) aegypti* (Linnaeus)

Culex aegypti LINNAEUS, 1762, Hasselquists' Reise nach Palestina, p. 470¹; EDWARDS, 1911, Bul. Ent. Res., 2:265.

Aedes aegypti, DYAR, 1920, Ins. Insc. Mens., 8:181, 204; DYAR, 1928, Carnegie Inst. Wash. Pub. No. 387, p. 239; MATHESON, 1929, Mosqs. North America, p. 140; KING, BRADLEY and McNEEL, 1939, U. S. Dept. Agric., Misc. Pub. No. 336, p. 43.

(Synonyms: *Culex argenteus* Poiret; *Aedes argenteus*, Knab; *Culex fasciatus* Fabricius; *Stegomyia fasciata*, Reed and Carroll; *Aedes fasciatus*, Martini; *Inscules fasciatus*, Herrera; *Culex calopus* Meigen; *Stegomyia calopus*, Blanchard; *Aedes calopus*, Dyar and Knab; *Culex mosquito* Robineau-Desvoidy; *Culex frater* Robineau-Desvoidy; *Culex sugens* Wiedemann ?; *Culex taeniatus* Wiedemann; *Culex kounoupi* Brulle; *Culex niveus* Eichwald ?; *Culex toxorhynchus* Macquart; *Culex annulitarsis* Macquart; *Culex viridifrons* Walker; *Culex excitans* Walker; *Culex formosus* Walker; *Culex inexorabilis* Walker; *Culex exagitans* Walker; *Culex insatiabilis* Bigot; *Culex impatibilis* Walker; *Culex bancrofti* Skuse; *Culex elegans* Ficalbi; *Culex rossii* Giles; *Stegomyia fasciata* var. *luciensis* Theobald; *Stegomyia fasciata* var. *queenslandensis* Theobald; *Stegomyia nigeria* Theobald; *Stegomyia fasciata* var. *persistans* Banks; *Culex anguste-alatus* Becker; *Culex albopalpus* Becker; *Duttonia alboannulis* Ludlow; *Aedes fasciata* var. *atritarsis* Edwards; for complete synonymy see Howard, Dyar and Knab, 1917, Dyar, 1928, and Edwards, 1932, Genera Insect., fasc. 194.)

Through the aid of Sr. Green of the health department, seven specimens (four males) of this mosquito were obtained from the Cape region. Although in a poor state of preservation, sufficient characters remain to make the identification possible; the terminalia are quite typical of this species. All of the females are well engorged with blood.

Type locality: Egypt¹.

Recorded distribution: Tropico- and sub-tropicopolitan; occasionally invading temperate regions in summer; Lower California: Distrito del Sur (La Paz, A. Dugès—Theobald, 1907, Monog. Culic., 4:177 (*S. fasciata*), Howard, Dyar and Knab, 1917, p. 839, *A. calopus*).

New records: Distrito del Sur (San José del Cabo, July 11, 1938, Sr. Green).

*** (7) *Culex (Culex) tarsalis* Coquillett**

Culex n.sp. WILLISTON, 1893, No. Amer. Fauna No. 7, Div. Orn. and Mam., U. S. Dept. Agric., p. 253.

Culex tarsalis COQUILLET, 1896, Canad. Ent., 28:43¹; HOWARD, DYAR and KNAB, 1915, Carnegie Inst. Wash., Pub. No. 159, 3:230 (*willistoni*, *affinis*, *kelloggi*, *peus*, syn.; record²); DYAR and KNAB, 1917, Ins. Insc. Mens., 5:174; DYAR, 1918, Ins. Insc. Mens., 6:96; *ibid.*, 1924, 12:95; FREEBORN, 1926, Univ. Calif. Pub., Tech. Bull., Ent., 3:435; DYAR, 1928, Carnegie Inst. Wash., Pub. No. 387, p. 383; MATHESON, 1929, Mosqs. North America, p. 169; MARTINI, 1935, Dept. Salub. Pub., Bol. Tee., Serie A, No. 1, p. 58.

Culex willistoni GILES, 1900, Handb. Gnats or Mosqs., p. 281.

Culex affinis ADAMS, 1903, Kansas Univ. Sci. Bull., 20:25.

Culex kelloggii THEOBALD, 1903, Canad. Ent., 25:211.

Culex peus SPEISER, 1904, Insektenb., 21:148.

A series of 26 specimens (12 males) were examined. The majority exhibit the typical "V"-shaped, ventral abdominal markings and longitudinal white line on the legs characteristic of this species. Those from Coyote Cove resemble the closely-allied *Culex stigmatosoma* Dyar in external markings, but the male

terminalia indicate they are *tarsalis*. Terminalia preparations from Concepcion Bay and San Fernando Mission carry an additional seta on the apical lobe between the "leaflet" and the second seta; i.e., the apical lobe consists of a seta, a rod-like "leaflet," two setae and two rods; the rod-like "leaflet" is somewhat pointed. The outer blade of the phallosome has four recurved hooks and the heavy outer bristles of the paraprocts are distinctly blunt.

A large collection of larvae and pupae from Concepcion Bay were examined; the hair tufts of the air tube are typically in line, but the subdorsal hair tufts of abdominal segments III and IV vary from three to four branches.

Type locality: Argus Mountains, Inyo County, California, April, 1891, A. Koebele¹.

Recorded distribution: North America from the Mississippi River west to the Pacific Ocean and from southern Canada to the state of Guerrero, Mexico; Lower California: Distrito del Norte (Tiajuana, Dyar and Caudell)².

New records: Distrito del Norte (10 miles south of Punta Prieta, June 21; San Fernando Mission, July 31), Distrito del Sur [Coyote Cove, Concepcion Bay, 19 miles south of Mulegé, July 1 (adults, larvae and pupae), July 24].

Only the specimens from Coyote Cove are engorged with blood.

* (8) *Culex (Culex) stigmatosoma* Dyar?

Culex stigmatosoma DYAR, 1907, Proc. U. S. Nat. Mus., 32:123¹; HOWARD, DYAR and KNAB, 1915, Carnegie Inst. Wash., Pub. No. 159, 3:236; DYAR and KNAB, 1917, Ins. Insc. Mens., 5:174; DYAR, 1918, Ins. Insc. Mens., 6:96; *ibid.*, 1924, 12:96 (*eumimetes*, syn.); FREEBORN, 1926, Univ. Calif. Pub., Tech. Bull., Ent., 3:438; DYAR, 1928, Carnegie Inst. Wash., Pub. No. 387, p. 368 (*thriambus*, syn.); MATHESON, 1929, Mosqs. North America, p. 176; RIPSTEIN, 1935, An. Inst. Biol. México, 6:227; MARTINI, 1935, Dept. Salub. Pub., Bol. Tec., Serie A, No. 1, p. 58.

Culex eumimetes DYAR and KNAB, 1908, Proc. U. S. Nat. Mus., 35:61; HOWARD, DYAR and KNAB, 1915, Carnegie Inst. Wash., Pub. No. 159, 3:238.

Culex thriambus DYAR, 1921, Ins. Insc. Mens., 9:33.

This species, which is very closely allied and frequently indistinguishable from *Culex tarsalis*, is included here with hesitation. Two female specimens are at hand from San José del Cabo which appear to be *stigmatosoma*; the ventral abdominal dark spots, which are indistinct, tend to be rounded, and the legs are brown (except for the under sides of the femora and the leg joints), the longitudinal white leg stripe of *tarsalis* being absent.

A series of 39 larvae and 34 pupae from Comondu were examined and tentatively placed here. The subdorsal hair tuft of abdominal segments III and IV vary from three to five branches, the three- and four-branched condition predominating (about half and half). The number of air tube hair tufts varies from five to six, and the subapical tuft is in the majority of cases distinctly out of line; one larva has them all in line (*tarsalis* condition), but there are intergrades between the two.

Type locality: Pasadena, Los Angeles County, California, H. G. Dyar¹.

Recorded distribution: Western United States south to Venezuela.

New records: Distrito del Sur [San José Cabo, July 11, Sr. Green; Comondu, July 21 (larvae and pupae)].

(9) **Culex (Culex) quinquefasciatus** Say

Culex quinquefasciatus SAY, 1823, Jour. Acad. Nat. Sci. Phila., 3:10 (described as *Culex 5-fasciatus*); HOWARD, DYAR and KNAB, 1915, Carnegie Inst. Wash., Pub. No. 159, 3:345; FREEBORN, 1926, Univ. Calif. Pub., Tech. Bull., Ent., 3:431; DYAR, 1928, Carnegie Inst. Wash., Pub. No. 387, p. 380; MATHESON, 1929, Mosqs. North America, p. 165.

(Synonyms: *Culex fatigans* Wiedemann; *pungens* Wiedemann?; *acer* Walker; *cubensis* Bigot; *cingulatus* Doleschall?; *anxifer* Bigot; *serotinus* Philippi?; *autumnalis* Weyenbergh; *penafielii* Williston; *macleayi* Skuse; *doleschalli* Giles; *skusii* Giles; *fatigans* var. *luteoannulatus* Theobald; *fatigans* var. *trilineatus* Theobald; *fouchowensis* Theobald; *quasipipiens* Theobald; *reesi* Theobald; *sericeus* Theobald; *albolineatus* Giles; *cartroni* Ventrillon; *barbarus* Dyar and Knab; *didieri* Neveu-Lemaire?; *pygmaeus* Neveu-Lemaire; *christophersi* Theobald; *quasilinealis* Theobald; *raymondii* Tamayo, *stochri* Theobald; *minor* Theobald; *lachrimans* Dyar and Knab; *revocator* Dyar and Knab; *goughi* Theobald ♂; *scotti* Theobald ♂; *Culicelsa fuscus* Taylor; *Culex aseychae* Dyar and Knab; *townsvillensis* Taylor; *hensemacon* Dyar; *fatigans* var. *nigrirostris* Enderlein; see Edwards, 1932, p. 208).

This species appears to be represented on the peninsula by the subspecies *dipseticus* Dyar and Knab.

* (9a) **Culex (Culex) quinquefasciatus dipseticus** Dyar and Knab

Culex quinquefasciatus race *dipseticus* DYAR and KNAB, 1909, Proc. Ent. Soc. Wash., 11:34¹ (record²); HOWARD, DYAR and KNAB, 1915, Carnegie Inst. Wash., Pub. No. 159, 3:347 (record²).

Culex fatigans, RIPSTEIN, 1935, An. Inst. Biol. México, 6:213; MARTINI, 1935, Dept. Salub. Pub., Bol. Tec., Serie A, No. 1, p. 57 (in part?; record²).

This subspecies was not collected by the Michelbachers and Ross. On the basis of terminalia characters which are apparently intermediate between *Culex pipiens* Linnaeus and *Culex quinquefasciatus* s.s., the writer follows Dyar and Knab in considering the form occurring in Lower California and portions of Mexico *Culex quinquefasciatus dipseticus* (see also Howard, Dyar and Knab, 1915, p. 354, Freeborn, 1926, p. 431 and Ripstein, 1935, p. 213).

Type locality: Indio, Riverside County, California, June 10, 1906, A. N. Caudell¹.

Recorded distribution: Southwestern United States, southwards along the west coast of Mexico, possibly in the Valley of Mexico; Lower California: Distrito del Sur (La Paz, A. Dugès²).